I. Amendments to the Specification

Please replace paragraph [0019] with the following amended paragraph:

[0019] As noted, it is a feature of the second p-type semiconductor layer 16 that it includes a graded doping concentration. The presence of dopants in the second p-type semiconductor layer 16 is controlled in order to optimize the performance of the photodiode. A first concentration 15 is located near the first p-type semiconductor 14, and a second concentration 17 is directly adjacent to the n-type semiconductor 18. Preferably, ~~the first concentration 15~~ D is between 800 and 1,000 angstroms deep, i.e. the dimension parallel to the travel of the carriers.

Please replace paragraph [0020] with the following amended paragraph:

[0020] In the preferred embodiment, the first concentration 15 is greater than the second concentration 17. In particular, the first concentration 15 is located at a position x_o and defines a dopant concentration p_o. A preferred doping concentration gradient is governed by the following equation:

$$(1) \qquad p = p_o e^{\frac{-x}{D}}$$

over the depth D of the second p-type semiconductor layer 16 for all x and D greater than zero. ~~A graph representative of Equation (1) is shown in Figure 4.~~ A generic representation of the dopant concentration *p* is shown in Figure 4.

Please replace paragraph [0024] with the following amended paragraph:

[0024] Another aspect of the graded doping concentration of the second p-type semiconductor layer 16 is the creation of a pseudo-electric field. The electrons generated in the first concentration 15 region are subject to this pseudo-field shown below as

$$\cancel{(2) \qquad E =} \left(\frac{kT}{q}\right)\frac{dp}{dx},$$

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(2) $$E = -\left(\frac{kT}{q}\right)\frac{dp}{dx}\frac{1}{p},$$

where k is Boltzman's constant, T is the temperature, q is the charge of an electron, and the value $\frac{dp}{dx}$ is the doping concentration gradient.

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